

**WHAT IS CLAIMED IS:**

1. A method for satisfying a single request from a client for a plurality of content components derived from content hosted by a plurality of distinct, separately accessible component servers, comprising:

5 receiving a single request specifying the content components;

after receiving the single request, generating a plurality of information requests for the content;

10 sending each information request to the component server hosting the content corresponding to the information request before receiving a response to any of the information requests;

15 forming the content components from the responses to the information requests; and transmitting the content components to the client.

2. The method of claim 1, wherein:

the single request is a request for a personalized Web page;

15 the forming step comprises assembling the personalized Web page from the content components; and

the transmitting step comprises sending the personalized Web page to the client.

20 3. The method of claim 2, further comprising:

instantiating a timer after the step of sending each information request and before the step of forming the personalized web page; and

if no response is received from one of the component servers prior to a timeout period of the timer, performing the steps of

25 immediately establishing the response from that component server as a null value, and

carrying out the steps of forming the personalized Web page and transmitting the personalized Web page to the client without waiting for that response.

30 4. The method of claim 3, wherein the component servers generate the responses in different data formats, further comprising:

converting the responses to a common data format.

5. The method of claim 4, wherein the common data format is based on a markup language.

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6. The method of claim 4, wherein the converting step is performed at the respective component servers.

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7. The method of claim 4, wherein the converting step is performed at a main server, the main server also receiving the single request from the user and transmitting the personalized Web page to the client.

8. The method of claim 7, wherein the main server is a corporate portal server.

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9. The method of claim 7, wherein the main server is an Internet portal server.

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10. The method of claim 7, wherein each of the main server and the component servers are physically separate, and wherein the information requests and responses are transmitted according to a standard network protocol.

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11. The method of claim 10, wherein the standard network protocol is selected from the group consisting of HTTP, HTTPS, WAP, and FTP.

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12. The method of claim 11, wherein the component servers are each selected from the group consisting of email servers, enterprise resource planning servers, and customer relationship management servers.

13. The method of claim 3, wherein the information requests are transmitted according to a standard network protocol.

14. The method of claim 13, wherein the standard network protocol is selected from the group consisting of HTTP, HTTPS, WAP, and FTP.

15. The method of claim 1, further comprising:  
5 generating a state machine to represent the progress of each information request; and recursively processing the state machines to advance the progress of each information request.

16. Computer-readable media embodying instructions executable by a computer  
10 to perform a method for satisfying a single request from a client for a plurality of content components derived from content hosted by a plurality of distinct, separately accessible component servers, the method comprising:

receiving a single request specifying the content components;  
15 after receiving the single request, generating a plurality of information requests for the content;  
sending each information request to the component server hosting the content corresponding to the information request before receiving a response to any of the information requests;  
20 forming the content components from the responses to the information requests; and transmitting the content components to the client.

17. The media of claim 16, wherein the method further comprises:  
the single request is a request for a personalized Web page;  
25 the forming step comprises assembling the personalized Web page from the content components; and  
the transmitting step comprises sending the personalized Web page to the client.

18. The media of claim 17, wherein the method further comprises:  
instantiating a timer after the step of sending each information request and before the  
30 step of forming the personalized web page; and

if no response is received from one of the component servers prior to a timeout period of the timer, performing the steps of

immediately establishing the response from that component server as a null value, and

carrying out the steps of forming the personalized Web page and transmitting the personalized Web page to the client without waiting for that response.

19. The media of claim 18, wherein the component servers generate the responses in different data formats, wherein the method further comprises:

10 converting the responses to a common data format.

20. The media of claim 19, wherein the common data format is based on a markup language.

15 21. The media of claim 19, wherein the converting step is performed at the respective component servers.

22. The media of claim 19, wherein the converting step is performed at a main server, the main server also receiving the single request from the user and transmitting the 20 personalized Web page to the client.

23. The media of claim 22, wherein the main server is a corporate portal server.

24. The media of claim 22, wherein the main server is an Internet portal server.

25 25. The media of claim 22, wherein each of the main server and the component servers are physically separate, and wherein the information requests and responses are transmitted according to a standard network protocol.

30 26. The media of claim 25, wherein the standard network protocol is selected from the group consisting of HTTP, HTTPS, WAP, and FTP.

27. The media of claim 26, wherein the component servers are each selected from the group consisting of email servers, enterprise resource planning servers, and customer relationship management servers.

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28. The media of claim 18, wherein the information requests are transmitted according to a standard network protocol.

10 29. The media of claim 28, wherein the standard network protocol is selected

from the group consisting of HTTP, HTTPS, WAP, and FTP.

15 30. The media of claim 16, wherein the method further comprises:  
generating a state machine to represent the progress of each information request; and  
recursively processing the state machines to advance the progress of each information request.

31. An apparatus for satisfying a single request from a client for a plurality of content components derived from content hosted by a plurality of distinct, separately accessible component servers, comprising:

20 means for receiving a single request specifying the content components;  
means for, after receiving the single request, generating a plurality of information requests for the content;

25 means for sending each information request to the component server hosting the content corresponding to the information request before receiving a response to any of the information requests;

means for forming the content components from the responses to the information requests; and

means for transmitting the content components to the client.

30 32. The apparatus of claim 31, wherein:

the single request is a request for a personalized Web page;

the means for forming comprises assembling the personalized Web page from the content components; and

the means for transmitting comprises sending the personalized Web page to the client.

5           33.     The apparatus of claim 32, further comprising:

means for instantiating a timer after the step of sending each information request and before the step of forming the personalized web page; and

means for, if no response is received from one of the component servers prior to a timeout period of the timer, performing the steps of

10           immediately establishing the response from that component server as a null

value, and

carrying out the steps of forming the personalized Web page and transmitting the personalized Web page to the client without waiting for that response.

15           34.     The apparatus of claim 33, wherein the component servers generate the

responses in different data formats, further comprising:

means for converting the responses to a common data format.

20           35.     The apparatus of claim 34, wherein the common data format is based on a

markup language.

25           36.     The apparatus of claim 34, wherein the means for converting is part of the respective component servers.

37.     The apparatus of claim 34, wherein the means for converting is part of a main server, the main server also receiving the single request from the user and transmitting the personalized Web page to the client.

30           38.     The apparatus of claim 37, wherein the main server is a corporate portal

server.

39. The apparatus of claim 37, wherein the main server is an Internet portal server.

5 40. The apparatus of claim 37, wherein each of the main server and the component servers are physically separate, and wherein the information requests and responses are transmitted according to a standard network protocol.

10 41. The apparatus of claim 40, wherein the standard network protocol is selected from the group consisting of HTTP, HTTPS, WAP, and FTP.

15 42. The apparatus of claim 41, wherein the component servers are each selected from the group consisting of email servers, enterprise resource planning servers, and customer relationship management servers.

20 43. The apparatus of claim 33, wherein the information requests are transmitted according to a standard network protocol.

25 44. The apparatus of claim 43, wherein the standard network protocol is selected from the group consisting of HTTP, HTTPS, WAP, and FTP.

45. The apparatus of claim 31, further comprising:  
means for generating a state machine to represent the progress of each information request; and  
means for recursively processing the state machines to advance the progress of each information request.

30 46. An apparatus for satisfying a single request from a client for a plurality of content components derived from content hosted by a plurality of distinct, separately accessible component servers, the apparatus comprising a processor configured to perform the steps of:

receiving a single request specifying the content components;

after receiving the single request, generating a plurality of information requests for the content;

sending each information request to the component server hosting the content corresponding to the information request before receiving a response to any of the information requests;

5 forming the content components from the responses to the information requests; and transmitting the content components to the client.

10 47. The apparatus of claim 46, wherein:

the single request is a request for a personalized Web page;

15 the forming step comprises assembling the personalized Web page from the content components; and

the transmitting step comprises sending the personalized Web page to the client.

15 48. The apparatus of claim 47, wherein the processor is further configured to perform the steps of:

instantiating a timer after the step of sending each information request and before the step of forming the personalized web page; and

20 if no response is received from one of the component servers prior to a timeout period of the timer, performing the steps of

immediately establishing the response from that component server as a null value, and

carrying out the steps of forming the personalized Web page and transmitting the personalized Web page to the client without waiting for that response.

25 49. The apparatus of claim 48, wherein the component servers generate the responses in different data formats, wherein the processor is further configured to perform the steps of:

30 converting the responses to a common data format.

50. The apparatus of claim 49, wherein the common data format is based on a markup language.

51. The apparatus of claim 49, wherein the converting step is performed at the  
5 respective component servers.

52. The apparatus of claim 49, wherein the converting step is performed at a main server, the main server also receiving the single request from the user and transmitting the personalized Web page to the client.

10 53. The apparatus of claim 52, wherein the main server is a corporate portal server.

15 54. The apparatus of claim 52, wherein the main server is an Internet portal server.

20 55. The apparatus of claim 52, wherein each of the main server and the component servers are physically separate, and wherein the information requests and responses are transmitted according to a standard network protocol.

56. The apparatus of claim 55, wherein the standard network protocol is selected from the group consisting of HTTP, HTTPS, WAP, and FTP.

25 57. The apparatus of claim 56, wherein the component servers are each selected from the group consisting of email servers, enterprise resource planning servers, and customer relationship management servers.

30 58. The apparatus of claim 48, wherein the information requests are transmitted according to a standard network protocol.

59. The apparatus of claim 58, wherein the standard network protocol is selected from the group consisting of HTTP, HTTPS, WAP, and FTP.

60. The apparatus of claim 46, wherein the processor is further configured to  
5 perform the steps of:

generating a state machine to represent the progress of each information request; and  
recursively processing the state machines to advance the progress of each information  
request.